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EXAMINER

SANTOS, PATRICK J D

ART UNIT	PAPER NUMBER
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2161

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/994,138

Applicant(s)

KABRA ET AL.

Examiner

Patrick J Santos

Art Unit

2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-70 is/are rejected.
- 7) ☒ Claim(s) 7,42 and 56-70 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims numbered 68 are objected to. Right after claim 66, there are two Claim 68's. Examiner suggests that the first Claim 68 numbers was a typographic error. For purposes of examination, Examiner will denote the first Claim 68 as Claim 67. Appropriate correction is required.
2. Claims 7 and 42 are objected to. In terms of claim language, Claims 5-7 and 41-43 respectively correspond to each other. However, Claim 7 depends on Claim 5, but Claim 42 depends on Claim 41. Examiner suggests that this may have been a numbering error. However, if Applicant indicated that Claims 5-7 and Claims 41-43 were intended to have different dependency structures, Examiner will withdraw objection.
3. Claims 56-70 are objected to. Independent Claim 56 recites, "An system" rather than "A system" (Claim 56, ln. 1). Appropriate correction is required. Claims 57-70 are dependent on Claim 56 and inherit same deficiency.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 36-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 36 recites, in part, "(e) change the locked and unlocked partitions and repeating steps (d) and (e)" rather than "(e) change the locked and unlocked partitions and repeating steps (c) and (d)." As currently stated, if Claim 36 in step (e) were to repeat step (e), it would result in an inoperable infinite loop. For purposes of prosecution, Examiner has provided prior art rejections on the assumption that repeating steps (c) and (d) were intended. Claims 37-55 which depend on Claim 36 inherit same deficiency.

6. The term "efficiently" in Claims 34 and 69 (Claim 34, ln. 13 and Claim 69, ln. 13) is a relative term which renders the claim indefinite. The term "efficiently" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 21-27, 31, 34-35, 56-62, 66, and 69-70 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,765,168 issued to Burrows ("Burrows '168").

Claim 21:

Regarding Claim 21, Burrows '168 discloses: a method of updating an electronic document for information retrieval (Burrows '168: col. 1, lns. 31-36 - note the index reads on a document), the electronic document including a main portion stored in a first storage device having a given access speed (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16 - note DRAM has significantly faster access times than disk), the method comprising the steps of:

- (a) providing a supplemental portion in a second storage device having an access speed faster than the first storage device (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16 - note DRAM has significantly faster access times than disk);
- (b) storing, updates of the electronic document in the supplemental portion (Burrows '168: col. 12, lns. 50-59);
- (c) causing queries of the electronic document to read both the supplemental portion and the main portion (Burrows '168: col. 4, lns. 13-16 - queries are directed to the entire index including both DRAM and disk portions); and
- (d) at predetermined intervals, merging the main portion with the supplemental portion (Burrows '168: col. 13, ln. 42-43 - note periodic maintenance);

whereby the electronic document may be updated concurrently with use (Burrows '168: col. 12, lns. 50-52).

Claim 22:

Regarding Claim 22, Burrows '168 discloses all the limitations of Claim 21 *supra*. Additionally, Burrows '168 discloses, wherein the electronic document is an index linking keywords to document identifiers and the update portion is linked keywords and document

identifiers for a new document (Burrows '168: col. 1, lns. 31-36 - note the index reads on a document).

Claims 23-27, 31, and 34-35:

Regarding Claims 23-27, 31, and 34-35, Burrows '168 discloses all the limitations of Claim 22 *supra*. Additionally, Burrows '168 discloses:

- (Claim 23) wherein the main portion is larger than the supplemental portion (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16 - note a system's DRAM is much smaller than its disk capacity).
- (Claim 24) wherein the first storage device is a disk drive and the second storage device is solid-state memory (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16).
- (Claim 25) wherein the predetermined interval is selected from the group consisting of: a periodic interval based on the amount of data stored in the supplemental portion and a constant periodic interval (Burrows '168: col. 13, lns. 45-49 - note merge criteria based on the amount of data stored).
- (Claim 26) wherein the merging of step (d) compacts the combined supplemental portion and main portion (Burrows '168: col. 4, lns. 33-36; col. 10, lns. 16-53; - note compression reads on compaction).
- (Claim 27) wherein the merging of step (d) computes global statistics of the combined supplemental portion and main portion (Burrows '168: col. 26, lns. 13-29).
- (Claim 31) further including the step of storing the keywords and document identifiers for a new document in a change-log file before step (d) of updating the main portion with the supplemental portion (Burrows '168: col. 26-27).

- (Claim 34) including the further steps of:
 - o dividing the main and supplemental portions of the index into a plurality of partitions (Burrows '168: col. 13, lns. 4-35 – note buckets and tiers);
 - o at step (b) storing keywords and document identifiers for the new document a predetermined partition of the supplemental portion (Burrows '168: col. 13, lns. 4-6);
 - o at the predetermined intervals, sequentially merging the partitions of the supplemental portion with corresponding partitions of the main portion (Burrows '168: lns. 42-43);
 - o receiving bulk-load keywords and document identifiers for the index (Burrows '168: col. 13, ln. 7 – note the words and locations pairing; further note that in order to load an index the index which stores keywords and document identifiers, the index must receive keywords and document identifiers);
 - o pre-dividing the bulk-load keywords and document identifiers into partitioned files related to the partitions of the main and supplemental portions of the index (Burrows '168: col. 13, lns. 4-20 – note that hashing reads on pre-dividing);
 - o sequentially storing a partitioned file in the second storage device and merging the partition file with the corresponding partition of the main portion (Examiner notes that storing a stream of data such as a bulk load is inherently sequential in nature);
 - o whereby bulk-load data may be efficiently integrated with the index (Burrows: col. 13, lns. 37-43).
- (Claim 35) wherein the partition file is merged with the corresponding partition of the main portion at a second predetermined interval different from the first predetermined

interval (Burrows '168: col. 13, ln. 42-43 - note periodic maintenance reads on merging at different intervals).

Claim 56:

Examiner notes Claim 56 to be the "system" embodiment of "method" Claim 21. Since the claim language of Claim 56 has an additional system limitation, prior art mapping is set forth as follows.

Regarding Claim 56, Burrows '168 discloses: a system allowing on-line updating (Burrows '168: col. 1, lns. 31-36 - note the index reads on a document) and comprising:

- an electronically readable document including a main portion stored in a first storage device having a given access speed and a supplemental portion in a second storage device having an access speed faster than the first storage device (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16 - note DRAM has significantly faster access times than disk);
- an electronic computer communicating with the electronically readable document and executing a stored program (Burrows '168: col. 2, lns. 46-63) to:
 - (a) store update portions in the supplemental portion (Burrows '168: col. 12, lns. 50-59);
 - (b) cause queries of the electronic document to read both the main portion and the supplemental portion (Burrows '168: col. 4, lns. 13-16 – queries are directed to the entire index including both DRAM and disk portions); and
 - (c) at predetermined intervals, merging the main portion with the supplemental portion (Burrows '168: col. 13, ln. 42-43 - note periodic maintenance);

- whereby the electronic document may be updated concurrently with use (Burrows '168: col. 12, lns. 50-52).

Claims 57-62, 66, and 69-70:

Regarding Claim 57, Burrows '168 discloses all the limitations of Claim 56 *supra*. Additionally, examiner notes Claims 57-62, 66, and 69-70 to be the "system" embodiment of "method" Claims 22-27, 31, and 34-35 respectively. Accordingly, Examiner rejects Claims 57-62, 66, and 69-70 on the same basis as Claims 22-27, 31, and 34-35 respectively.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-6, 8-18, 28-30, 36-41, 43-53, and 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burrows '168 in view of U.S. Patent No. 5,960,194 issued to Choy et al. ("Choy '194").

Claim 1:

Regarding Claim 1 Burrows '168 discloses: a method of updating an electronic document for information retrieval (Burrows '168: col. 1, lns. 31-36 - note the index reads on a document) comprising the steps of:

- (a) dividing the electronic document into a plurality of partitions (Burrows '168: col. 12, ln. 64 to col. 13, ln. 2);
- (f) updating each of the partitions over a predetermined period (Burrows '168: col. 13, ln. 42-43 - note periodic maintenance);

whereby the electronic document may be updated concurrently with use of the electronic document (Burrows '168: col. 12, lns. 50-52; col. 12, ln. 64 to col. 13, ln. 2). However, Burrows '168 does not explicitly disclose:

- (b) receiving for the electronic document, update portions;
- (c) matching the update portions to at least one partition;
- (d) concurrently locking at least one partition for updating while keeping at least one partition unlocked for reading;
- (e) updating the locked partition with the update portions only if the keyword matches with the locked partition; and
- (f) changing the locked and unlocked partitions and repeating steps (d) and (e)

Choy '194 discloses a partitioned index that implements locking. Specifically, Choy '194 discloses:

- (b) receiving for the electronic document, update portions (Choy '194: col. 5, lns. 37-38 - note insert and delete read on update);
- (c) matching the update portions to at least one partition (Choy '194: col. 5, lns. 36-42; col. 7, lns. 64-67);
- (d) concurrently locking at least one partition for updating while keeping at least one partition unlocked for reading (Choy '194: col. 5, lns. 36-42;

- (e) updating the locked partition with the update portions only if the keyword matches with the locked partition (Choy '194: col. 5, lns. 36-42; col. 7, lns. 64-67); and
- (f) changing the locked and unlocked partitions and repeating steps (d) and (e) (Choy '194: col. 5, lns. 36-42).

It would have been obvious to apply the partitioning and locking protocol of Choy '194 to the index of Burrows '168. The motivation to combine is suggested by Choy '194 which discloses improved retrieval efficiency in indexes such as that of Burrows '168 (Choy '194: col. 6, lns. 29-33). Furthermore, Choy '168 discloses compatibility of the partitioning and locking of Choy '168 with hash based indexes such as that of Burrows '168.

Claim 2:

Regarding Claim 2, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 1 *supra*. Additionally, Burrows '168 and Choy '194 in combination disclose: wherein the electronic document is an index linking a set of keywords to document identifiers, and the update portions are keywords and document identifiers for a new document and wherein at step (c) it is the keyword that is matched to a partition (Burrows '168: col. 1, lns. 31-44 - note the index reads on a document).

Claims 3, 6, and 8:

Regarding Claims 3, 6 and 8, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 2 *supra*. Additionally, Burrows '168 and Choy '194 in combination disclose:

- (Claim 3) further including the steps of:

- (g) matching portions of received queries to at least one partition (Choy '194: col. 6, lns. 21-27 - note a request reads on a query);
 - (h) reading partitions matched to the portions to respond to the query (Choy '194: col. 6, lns. 21-27 - note a request reads on a query).
- (Claim 6) further including the step of storing the keywords and document identifiers for a new document in a change-log file before step (e) of updating the locked partition with the keyword and document identifiers for the new document (Burrows '168: col. 26-27).
 - (Claim 8) wherein the partitions include an main portion stored in a first storage device having a first access speed and a supplemental portion stored in a second storage device having a second access speed faster than the first access speed (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16 - note DRAM has significantly faster access times than disk), and wherein step (e) updates the supplemental portion of the locked partition, and further including the steps of:
 - (g) causing queries of the index to read both the index portion and the supplemental portion (Burrows '168: col. 4, lns. 13-16 – queries are directed to the entire index including both DRAM and disk portions); and
 - (h) at predetermined intervals, merging the main portion with the supplemental portion (Burrows '168: col. 13, ln. 42-43 - note periodic maintenance).

Claim 4:

Regarding Claim 4, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 3 *supra*. Additionally, Burrows '168 and Choy '194 in combination disclose: wherein the matching of the portions of the queries to at least one partition of step (f)

and the matching of the keywords for the new document to at least one partition of step (c) use a common mapping means (Burrows '168: col. 13, lns. 4-11 - note the hash function is a common mapping).

Claim 5:

Regarding Claim 5 Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 3 *supra*. Additionally, Burrows '168 and Choy '194 in combination disclose: wherein the mapping means is a hash table accepting the keyword as an argument to produce a partition as a value (Burrows '168: col. 13, lns. 4-11).

Claims 9-15 and 18:

Regarding Claims 9-15 and 18, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 8 *supra*. Additionally, Burrows '168 and Choy '194 in combination disclose:

- (Claim 9) predetermined period of time at which partitions are updated with the keywords and documents for the new document is less than the periodic interval when the main portion of the partition is updated with the supplemental portion of the partition (Burrows '168: col. 27, ln. 31 - note that a once a day log processing includes updating the index).
- (Claim 10) wherein the main portions larger than the supplemental portion (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16 - note a system's DRAM is much smaller than its disk capacity).
- (Claim 11) wherein the first storage device is a disk drive and the second storage device is solid-state memory (Burrows '168: Fig. 2, items 71, 72, and 73; col. 4, lns. 13-16).

- (Claim 12) wherein the predetermined interval is selected from the group consisting of: a periodic interval based on the amount of data stored in the supplemental portion, a constant periodic interval, and a periodic interval based on the partition (Burrows '168: col. 13, lns. 45-49 - note merge criteria based on the amount of data stored).
- (Claim 13) wherein the merging of step (h) compacts the combined supplemental portion and main portion (Burrows '168: col. 4, lns. 33-36; col. 10, lns. 16-53; - note compression reads on compaction).
- (Claim 14) wherein the merging of step (h) computes global statistics of the combined supplemental portion and main portion (Burrows '168: col. 26, lns. 13-29).
- (Claim 15) wherein the merging of step (h) includes the steps of:
 - (i) freezing the supplemental portion and designating a second supplemental portion for receiving new keywords and document identifiers for new documents (Burrows '168: col. 14, lns. 8-17; Choy '194: col. 5, ln. 11);
 - (ii) combining the frozen supplemental portion and the main portion to create a second main portion (Burrows '168: col. 14, lns. 8-17; Choy '194: col. 5, ln. 11);
and
 - (iii) deleting the frozen supplemental portion and the main portion and using the second supplemental portion as the supplemental portion and using the second main portion as the main portion (Burrows '168: col. 14, lns. 8-17; Choy '194: col. 5, ln. 11).
- (Claim 18) further including the step of storing the keywords and document identifiers for a new document in a change-log file before step (e) of updating the locked partition

with the keyword and document identifiers for the new document (Burrows '168: col. 26-27).

Claims 16-17:

Regarding Claims 16-17, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 14 *supra*. Additionally, Burrows '168 and Choy '194 in combination disclose:

- (Claim 16) wherein during step (i) queries are directed to the frozen supplemental portion, the second supplemental portion and the main portion (Choy '194: col. 6, lns. 21-27 - note mapping to the relevant portion of the index).
- (Claim 17) wherein the supplemental portion and the main portions are identified by pointers and wherein step (iii) of using the second supplemental portion as the supplemental portion and using the second main portion as the main portion is accomplished by redirecting pointers (Burrows '168: col. 14, lns. 19-33).

Claim 28:

Regarding Claim 28, Burrows '168 discloses all the limitations of Claim 22 *supra*. Additionally, Burrows '168 discloses: wherein the merging of step (d) includes the steps of:

- (i) designating a second supplemental portion for receiving new keywords and document identifiers for new documents;
- (ii) combining the supplemental portion and the main portion to create a second main portion;

- (iii) deleting the supplemental portion and the main portion and using the second supplemental portion as the supplemental portion and using the second main portion as the main portion.

However, Burrows '168 does not explicitly disclose: freezing the supplemental portion.

Choy '194 discloses use of a locking protocol. Specifically, Choy '194 discloses: freezing the supplemental portion (Choy '194: col. 5, ln. 11).

It would have been obvious to apply the partitioning and locking protocol of Choy '194 to the index of Burrows '168. The motivation to combine is on the same basis as Claim 1 *supra*.

Claims 29-30:

Regarding Claims 29-30, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 28 *supra*. Additionally, Burrows '168 and Choy '194 disclose:

- (Claim 29) wherein during step (i) queries are directed to the supplemental portion, the second supplemental portion and the main portion (Choy '194: col. 6, lns. 21-27 - note mapping to the relevant portion of the index).
- (Claim 30) wherein the supplemental portion and the main portions are identified by pointers and wherein step (iii) of using the second supplemental portion as the supplemental portion and using the second main portion as the main portion is accomplished by redirecting pointers (Burrows '168: col. 14, lns. 19-33).

Claim 36:

Examiner notes Claim 36 to be the "system" embodiment of "method" Claim 1. Since the claim language of Claim 36 has an additional system limitation, prior art mapping is set forth as follows.

Regarding Claim 36 Burrows '168 discloses: A system for information retrieval
(Burrows '168: col. 1, lns. 31-36) comprising:

- an electronically readable document divided into a plurality of partitions (Burrows '168: col. 12, ln. 64 to col. 13, ln. 2);
- a program executed on an electronic computer and communicating with the electronically readable document (Burrows '168: col. 2, lns. 46-63) to:
 - (e) updating each of the partitions over a predetermined period (Burrows '168: col. 13, ln. 42-43 - note periodic maintenance);
- whereby the electronic document may be updated concurrently with use of the electronic document (Burrows '168: col. 12, lns. 50-52; col. 12, ln. 64 to col. 13, ln. 2).

However, Burrows '168 does not explicitly disclose:

- (a) receiving update portions;
- (b) matching the update portions to at least one partition;
- (c) concurrently lock at least one partition for updating while keeping at least one partition unlocked for reading;
- (d) update the locked partition with the update portions only if the keyword matches with the locked partition; and
- (e) change the locked and unlocked partitions and repeating steps (d) and (e)

Choy '194 discloses a partitioned index that implements locking. Specifically, Choy '194 discloses:

- (a) receiving update portions (Choy '194: col. 5, lns. 37-38 - note insert and delete read on update);

- (b) matching the update portions to at least one partition (Choy '194: col. 5, lns. 36-42; col. 7, lns. 64-67);
- (c) concurrently lock at least one partition for updating while keeping at least one partition unlocked for reading (Choy '194: col. 5, lns. 36-42;
- (d) update the locked partition with the update portions only if the keyword matches with the locked partition (Choy '194: col. 5, lns. 36-42; col. 7, lns. 64-67); and
- (e) change the locked and unlocked partitions and repeating steps (c) and (d) (Choy '194: col. 5, lns. 36-42).

It would have been obvious to apply the partitioning and locking protocol of Choy '194 to the index of Burrows '168. The motivation to combine is on the same basis as Claim 1 *supra*.

Claims 37-41, and 43-53:

Examiner notes Claims 37-39, 41, and 43-53 to be the "system" embodiment of "method" Claims 2-3, 6, and 8-18 respectively. Accordingly, Examiner rejects Claims 37-41, and 43-53 on the same basis as Claims 2-3, 6, and 8-18 respectively.

Claims 63-65:

Regarding Claim 63, Burrows '168 discloses all the limitations of Claim 57 *supra*. Additionally, examiner notes Claims 63-65 to be the "system" embodiment of "method" Claims 28-30 respectively. Accordingly, Examiner rejects Claims 63-65 on the same basis as Claims 28-30 respectively.

11. Claims 7, 19-20, 42, and 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burrows '168 and Choy '194 in view of U.S. Patent No. 6,219,676 issued to Reiner ("Reiner '676").

Claim 7:

Regarding Claim 7, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 5 *supra*. However, Burrows '168 and Choy '194 in combination do not explicitly disclose: wherein the change-log file includes a time stamp indicating the time of storing the keywords and document identifiers for a new document and the partitions include a time stamp indicating when the partition was last updated and wherein the step of updating the partition reads entries of the change-log file having a time stamp later than the time stamp of the partition and then updates the time stamp of the partition whereby updates are ensured to have been recorded in the change-log file.

Reiner '676 discloses the well-known technique of change logs and the least recently used algorithm. Specifically, Reiner '676 discloses: wherein the change-log file includes a time stamp indicating the time of storing the keywords and document identifiers for a new document and the partitions include a time stamp indicating when the partition was last updated and wherein the step of updating the partition reads entries of the change-log file having a time stamp later than the time stamp of the partition and then updates the time stamp of the partition whereby updates are ensured to have been recorded in the change-log file (Reiner '676: col. 7, lns. 43-64).

It would have been obvious to a person having ordinary skill in the art to apply the change log and least recently used algorithm techniques of Reiner '676 to the index partitions of

Burrows '168 and Choy '194 in combination. The motivation to combine is suggested by Reiner '676 which discloses the advantage that providing a change log guaranteed to be up to date to a large set of data, such as the partitioned index of Burrows '168 and Choy '194 in combination, obviates the need to do a full scan of that large set of data, since only the change log need be consulted (Reiner '676: col. 7, lns. 60-67).

Claims 19-20:

Regarding Claims 19-20, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 18 *supra*. However, Burrows '168 and Choy '194 in combination do not explicitly disclose:

- (Claim 19) wherein the change-log file includes a time stamp indicating the time of storing the keywords and document identifiers for a new document and the partitions portion include a time stamp indicating when the partition portion was last updated and wherein the step of updating the partition portion updates the time stamp of the partition portion whereby loss of the supplemental portion may be remedied by reference to the change-log file.
- (Claim 20) wherein the step (e) of updating the locked partition with the keyword and document identifiers includes the step of reviewing each partition for the earliest time stamp and deleting from the change-log file all keywords having an earlier timestamp than the earliest time stamp for all partitions.

Reiner '676 discloses:

- (Claim 19) wherein the change-log file includes a time stamp indicating the time of storing the keywords and document identifiers for a new document and the partitions

portion include a time stamp indicating when the partition portion was last updated and wherein the step of updating the partition portion updates the time stamp of the partition portion whereby loss of the supplemental portion may be remedied by reference to the change-log file (Reiner '676: col. 7, lns. 43-64).

- (Claim 20) wherein the step (e) of updating the locked partition with the keyword and document identifiers includes the step of reviewing each partition for the earliest time stamp and deleting from the change-log file all keywords having an earlier timestamp than the earliest time stamp for all partitions (Reiner '676: col. 7, lns. 43-64 – note the least recently used algorithm).

It would have been obvious to a person having ordinary skill in the art to apply the change log and least recently used algorithm of Reiner '676 to the index partitions of Burrows '168 and Choy '194 in combination. The motivation to combine is on the same basis as Claim 7 *supra*.

Claim 42:

Regarding Claim 42, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 41 *supra*. Additionally, Examiner notes Claim 42 to be the “system” embodiment of “method” Claim 7 respectively. Accordingly, Examiner rejects Claim 42 on the same basis as Claim 7.

Claims 54-55:

Regarding Claims 54, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 53 *supra*. Additionally, Examiner notes Claims 54-55 to be the “system”

embodiment of “method” Claims 19-20 respectively. Accordingly, Examiner rejects Claims 54-55 on the same basis as Claims 19-20 respectively.

12. Claims 32-33, and 67-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burrows ‘168 and Choy ‘194 in view of Reiner ‘676.

Claims 32-33:

Regarding Claims 32-33, Burrows ‘168 discloses all the limitations of Claim 31 *supra*.

However, Burrows ‘168 does not explicitly disclose:

- (Claim 32) wherein the change-log file includes a time stamp indicating the time of storing the keywords and document identifiers for a new document and the main portion include a time stamp indicating when the main portion was last updated and wherein the step of updating the main portion updates the time stamp of the main portion; whereby loss of the supplemental portion may be remedied by reference to the change-log file.
- (Claim 33) wherein the step (d) of updating the main portion includes the step of deleting from the change-log file all keywords having an earlier timestamp than that of the main portion.

Reiner ‘676 discloses:

- (Claim 32) wherein the change-log file includes a time stamp indicating the time of storing the keywords and document identifiers for a new document and the main portion include a time stamp indicating when the main portion was last updated and wherein the step of updating the main portion updates the time stamp of the main portion; whereby

loss of the supplemental portion may be remedied by reference to the change-log file (Reiner '676: col. 7, Ins. 43-64).

- (Claim 33) wherein the step (d) of updating the main portion includes the step of deleting from the change-log file all keywords having an earlier timestamp than that of the main portion (Reiner '676: col. 7, Ins. 43-64).

It would have been obvious to a person having ordinary skill in the art to apply the change log and least recently used algorithm techniques of Reiner '676 to the index partitions of Burrows '168. The motivation to combine is suggested by Reiner '676 which discloses the advantage that providing a change log guaranteed to be up to date to a large set of data, such as the partitioned index of Burrows '168, obviates the need to do a full scan of that large set of data, since only the change log need be consulted (Reiner '676: col. 7, Ins. 60-67).

Claims 67-68:

Regarding Claims 67-68, Burrows '168 and Choy '194 in combination disclose all the limitations of Claim 66 *supra*. Additionally, Examiner notes Claims 67-68 to be the "system" embodiment of "method" Claims 32-33 respectively. Accordingly, Examiner rejects Claims 67-68 on the same basis as Claims 32-33 respectively.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J.D. Santos whose telephone number is 571-272-4028. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 571-272-4023. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick J.D. Santos
March 14, 2005


FRANTZ COBY
PRIMARY EXAMINER